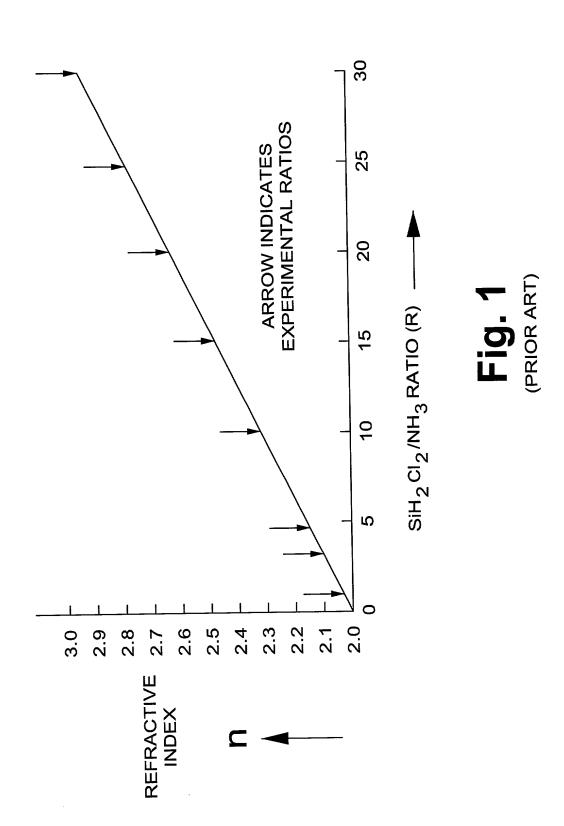
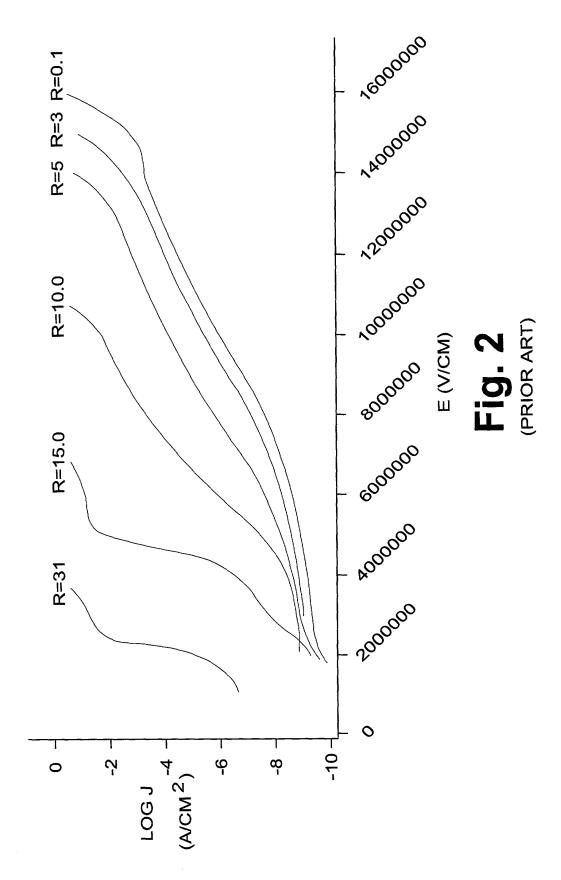
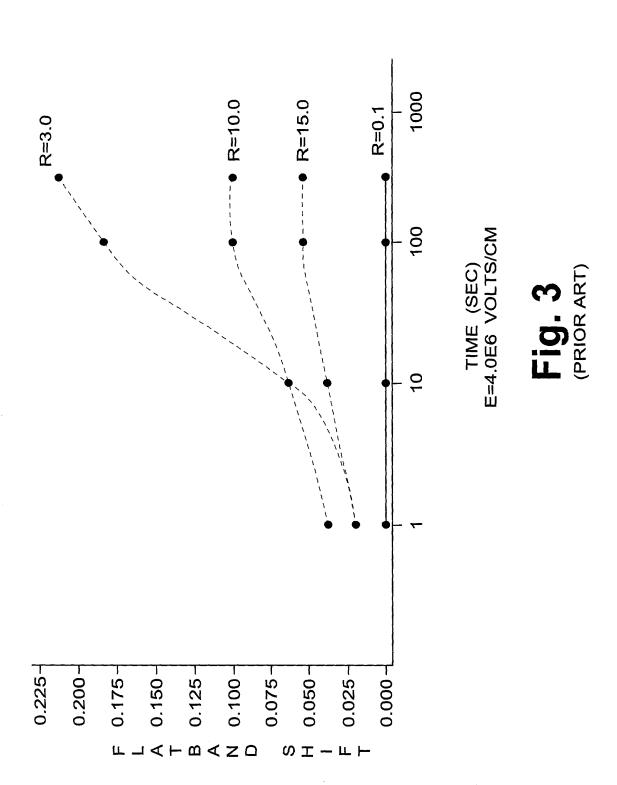
TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

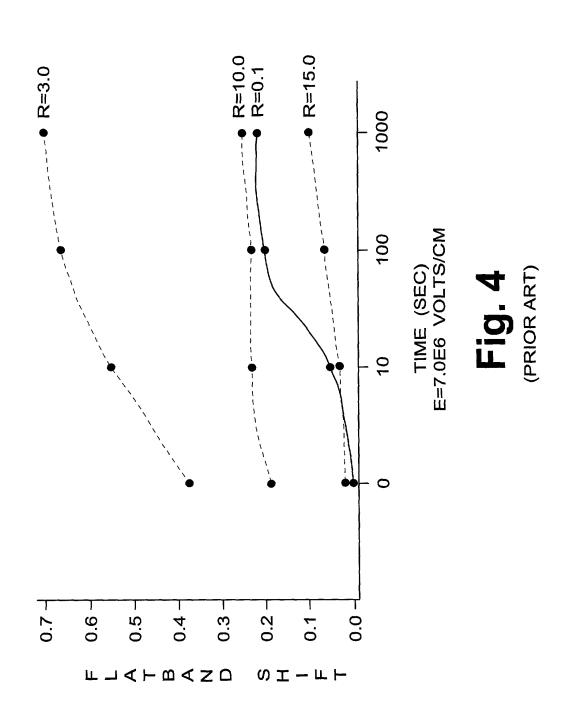




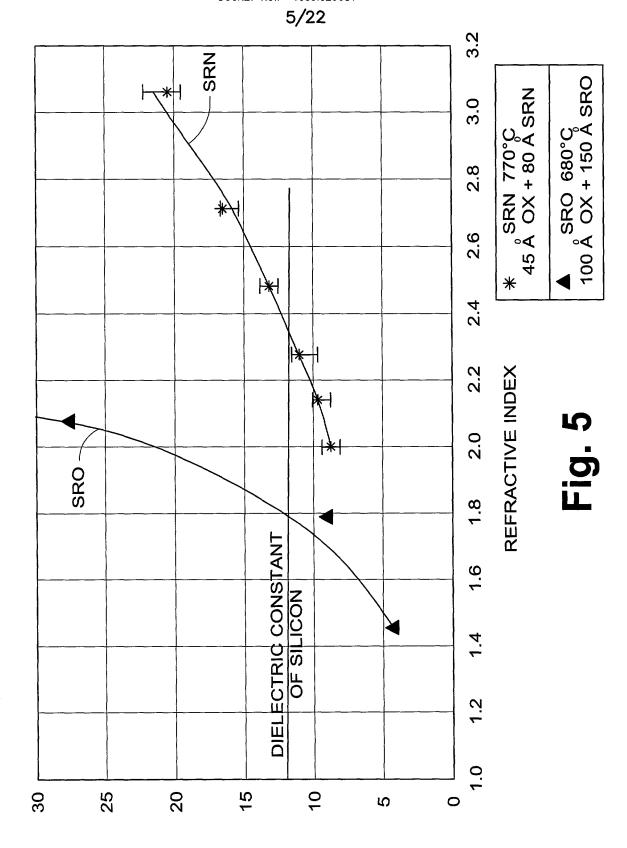
TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1



TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1



TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1



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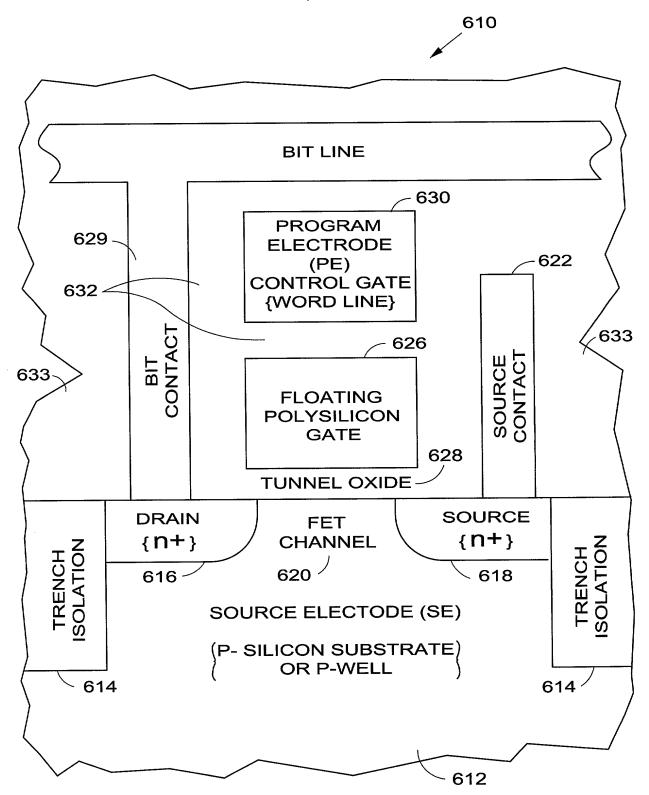


Fig. 6 (PRIOR ART)

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES

INVENTORS NAME: Arup Bhattacharyya DOCKET NO.: 1303.023US1

7/22 **PROGRAMMING** VOLTAGE (VP₁) $VP_1 = 16V$ 730 E_{TUN.OX} =12x10⁶ V/CM CONTROL 710 GATE . COUPLING pprox 0.6 EFFICIENCY 726 **FLOATING GATE** \odot 728 8 nm TUNNEL OXIDE n+ n+

Fig. 7

712 -

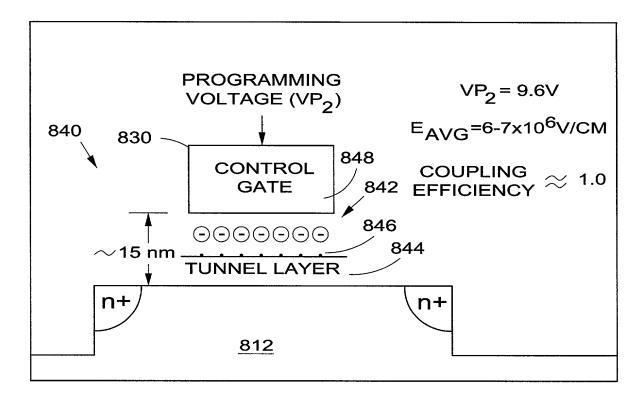


Fig. 8

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES _

INVENTORS NAME: Arup Bhattacharyya DOCKET NO.: 1303.023US1

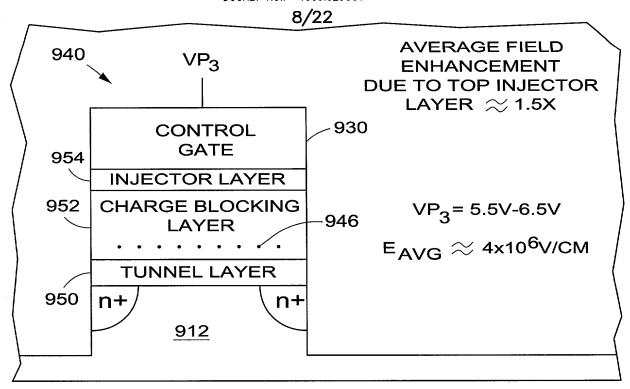


Fig. 9

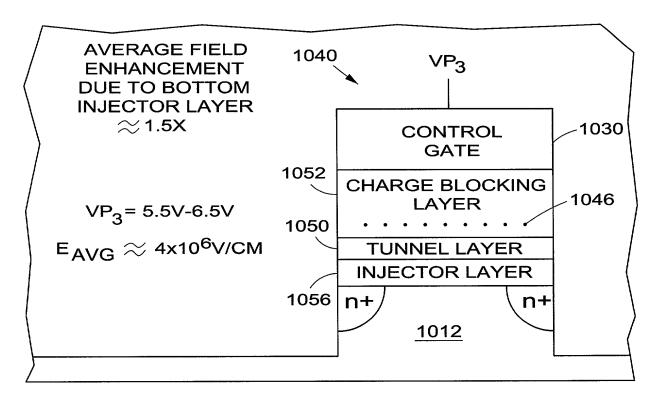


Fig. 10

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES

INVENTORS NAME: Arup Bhattacharyya DOCKET NO.: 1303.023US1

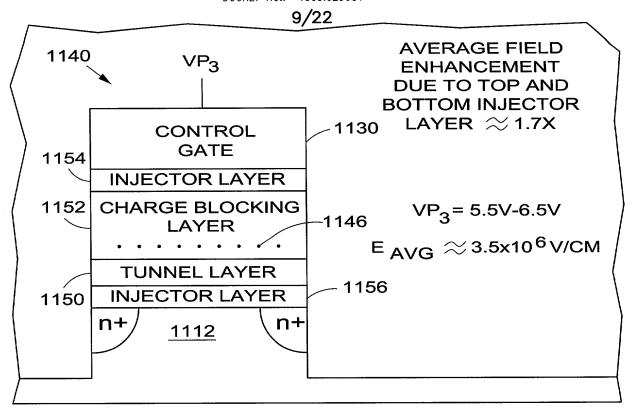


Fig. 11

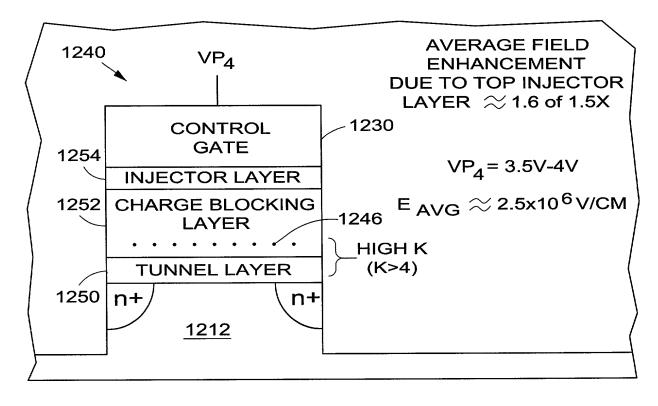


Fig. 12

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES ______

INVENTORS NAME: Arup Bhattacharyya DOCKET NO.: 1303.023US1

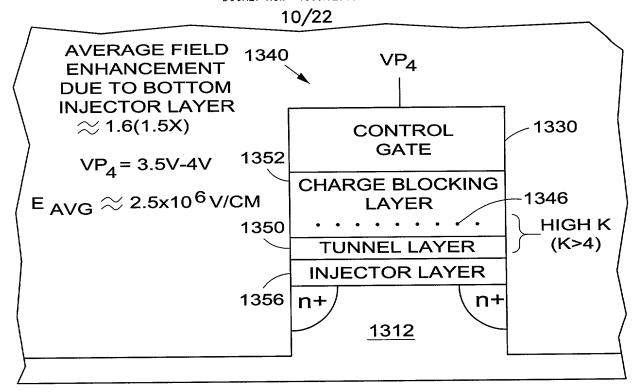


Fig. 13

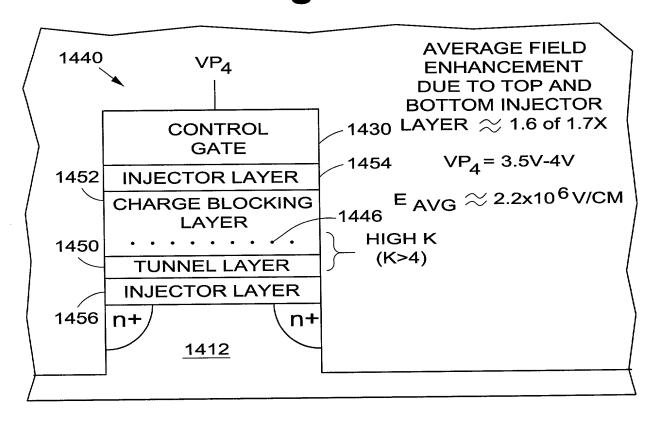
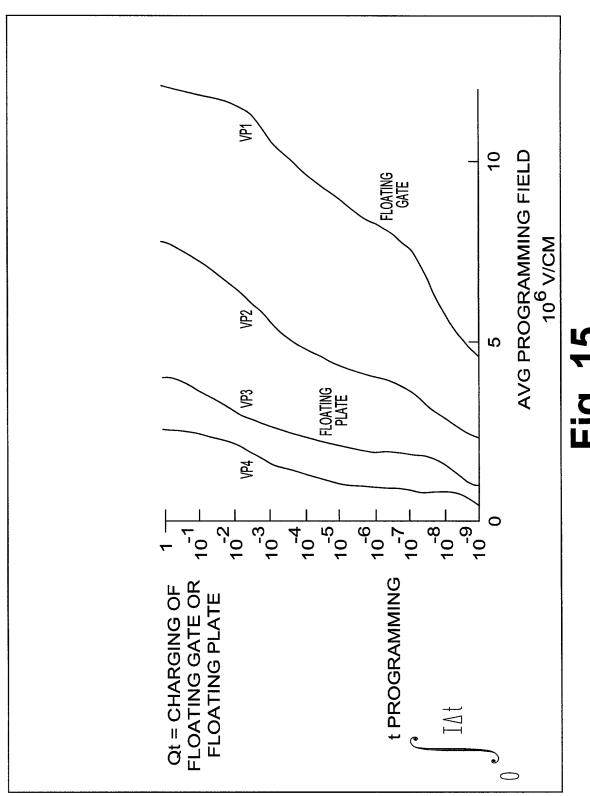


Fig. 14

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1



Fig

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

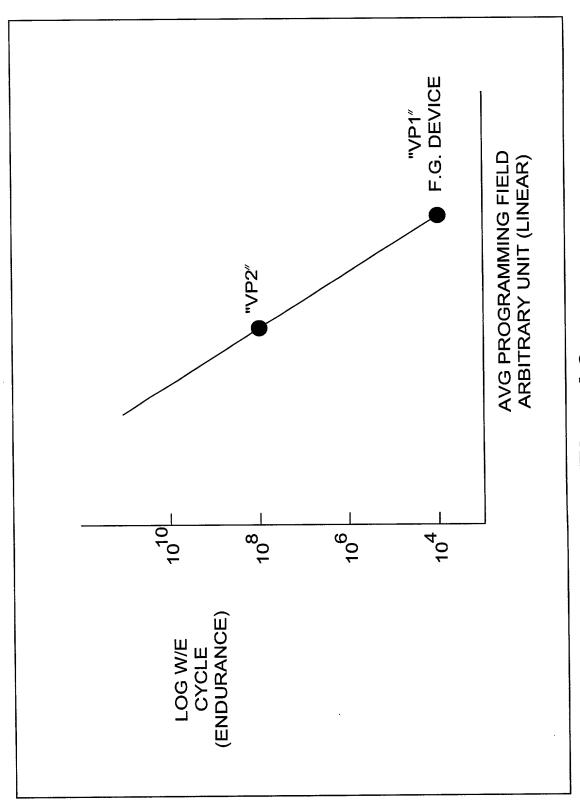


Fig. 16

1956 -

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I: STRUCTURES INVENTORS NAME: Arup Bhattacharyya DOCKET NO.: 1303.023US1 13/22 1730 1740 **GATE** (P.E.) **GATE** STACK 1742 DIFFUSION DIFFUSION SILICON REGION REGION **SUBSTRATE** (n+) (n+)(S.E.) 1716 1718 (p) 1712 Fig. 17 1842 PE 1854 -INJECTOR MEDIUM 1860 -HIGH K CHARGE BLOCKING AND CHARGE STORING MEDIUM 1850 -**TUNNEL MEDIUM** SE Fig. 18 1942 PE 1960 -HIGH K CHARGE BLOCKING AND CHARGE STORING MEDIUM 1950 -TUNNEL MEDIUM

Fig. 19

INJECTOR MEDIUM

SE

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

₽E				-44-1
	THICKNESS	tox.eq.	EFFECTIVE RANGE	
\(\text{\rightarrow} \)	5nm	1.5nm	3-10nm	
2060 SILICON-RICH AI ₂ O ₃	10-12nm	5nm	6-30. nm	····
2050 TUNNEL AI ₂ O ₃	9um	2.5nm	5-8nm	- 194 ·
SE				
	$t_{ox.eq.total} pprox 9nm$	mu6 >>		***
	VP	$V_{ m P}pprox~3.6V$		
	Ep⊗	$\approx 4x10^6 \text{ V/CM}$	//CM	

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVÎCES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

2142				
A	A H	THICKNESS	t ox.eq.	EFFECTIVE RANGE
2154	SRN (INJECTOR)	5nm	1.5nm	3-10nm
2160	SILICON-RICH AI 2 ^O 3	10-12nm	5nm	6-30nm
2150	TUNNEL SiO ₂	5nm	5nm	4-8nm
ı	SE			
		${\sf t}$ ox.eq.total $pprox$ 11.5nm	11.5nm	
		$V_{P} \approx 4.6V_{P}$	4.6V	
		E₽	$E_P \! pprox \; 4 x 10^v V / CM$	Σ
		The second secon		

Fig. 21

2250 -

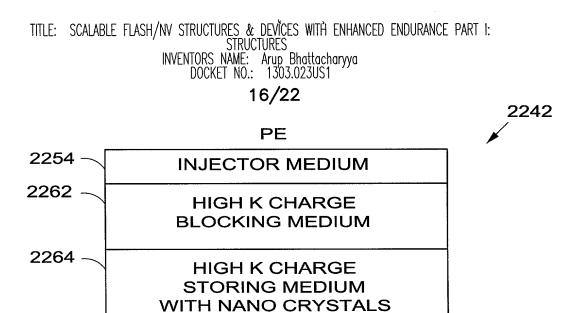


Fig. 22

TUNNEL MEDIUM

SE

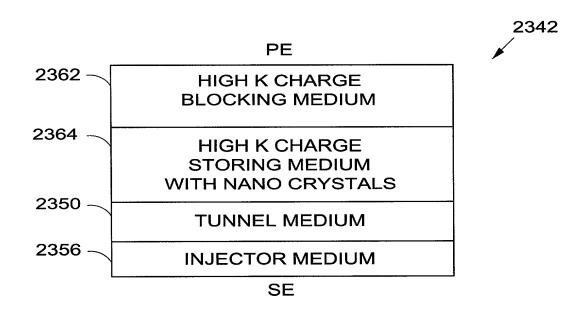


Fig. 23

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVIČES WITH ENHANCED ENDURANCE PART I: STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

PE 2454 SRN (INJECTOR) 2462 BLOCKING AI 2 0 3 AI 2 0 3 AI 2 0 3 AI 2 0 3 NANO CRYSTALS				
	OIHI	THICKNESS	tox.eq.	EFFECTIVE RANGE
		5nm	1.5nm	3-10nm
		10nm	4.5nm	6-30. nm
		4nm	1.6nm	3-5nm
TUNNEL AI 203	4,	5nm	2.5nm	5-8nm
SE				
	toxe	t ox.eq.total $pprox$ 10nm Vp $pprox$ 4V Ep $pprox$ 4x10 6	10nm 4V 4x10 ⁶ V/CM	∑

Fig. 24

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVIČES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

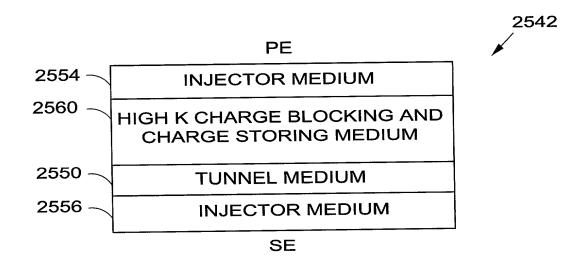


Fig. 25

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVIČES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

2650 SILICON-RICH Al $_2$ O3 2650 SILICON-RICH Al $_2$ O3 SERN (INJECTOR) SEN (INJECTOR) 5650 TUNNEL 5-6nm 5.5nm 6-30nm 5650 TUNNEL 5-6nm 2.5nm 5-8nm 2650 SILICON-RICH 50m 3-10nm 5650 TUNNEL 5-6nm 2.5nm 5-8nm 5650 SILICON-RICH 50m 6-30nm 5650 TUNNEL 5-6nm 5-8nm 5650 SILICON-RICH 50m 6-30nm 5650 TU 50m 5-8nm 5650 SILICON-RICH 50m 6-30nm 5650 TU 50m 5-8nm 5650 SILICON-RICH 50m 6-30nm 5650 TU 50m 5-8nm 5650 SILICON-RICH 50m 6650 TU 50m 7650 SILICON-RICH 50m 7650	0000					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	7047	Ш Д	THICKNESS	tox.eq.	EFFECTIVE RANGE	
SILICON-RICH Al_2O_3 $TUNNEL$ Al_2O_3 $SRN (INJECTOR)$ $\{"NH_3" OR "NO" SURFACE TREATED\}$ SE SE $tox.eq.total \approx 11.5nm$ $V_P \approx 3 TO 3.3V$ $E_P \approx 2.6 TO 3.0x10^6 V/CM$	2654 ~	SRN (INJECTOR)	5nm	1.5nm	3-10nm	······································
TUNNEL SIGNM 2.5nm 2.5nm SRN (INJECTOR) $\{\text{"NH}_3" \text{ OR "NO" SURFACE} \}$ SE $\{\text{"NH}_3" \text{ OR "NO" SURFACE} \}$ SE $tox.eq.total \approx 11.5nm tox.eq.total \approx 3.0 \times 10^6 \text{ V/CM} E_P \approx 2.6 \text{ TO } 3.0 \times 10^6 \text{ V/CM}$	2660 ~	SILICON-RICH Al 203	10-12nm	5nm	6-30nm	
SRN (INJECTOR)	2650 —	TUNNEL Al 203	5-6nm	2.5nm	5-8nm	13
t ox.eq.total \approx	2656	SRN (INJECTOR) {"NH3" OR "NO" SURFACE TREATED}	5nm	2.5nm	3-10nm	/22
the posterior of the state of		SE				
			${\sf t}_{\sf ox.eq.total} pprox 11$ ${\sf V_P} pprox 31$ ${\sf E_P} pprox 2.6$.5nm FO 3.3V 3 TO 3.0x10	0 ⁶ v/cm	

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVIČES WITH ENHANCED ENDURANCE PART I: STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
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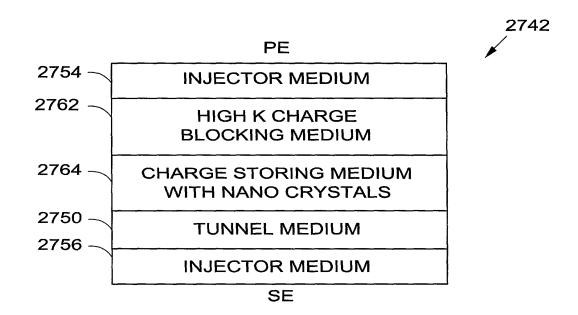


Fig. 27

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

					21/22		
	EFFECTIVE RANGE	3-10nm	6-30nm	3-5nm	5-8nm	3-10nm	V
	tox.eq.	1.5nm	4.5nm	1.6nm	2.5nm	2.5nm	12.6nm 3.25nm 2.6x10 ⁶ V/CM
	THICKNESS	5nm	10nm	4nm	5-6nm	5nm	t ox.eq.total $pprox$ 12 VP $pprox$ 3.2 EP $pprox$ 2.6
	PE	SRN (INJECTOR)	BLOCKING Al 203	AI ₂ O ₃ WITH Si NAÑO CRYSTALS	TUNNEL Al 203	SRN (INJECTOR) {"NH3" OR "NO" SURFACE TREATED}	SE
2842	A	2854	2862	2864	2850	2856	

TITLE: SCALABLE FLASH/NV STRUCTURES & DEVICES WITH ENHANCED ENDURANCE PART I:
STRUCTURES
INVENTORS NAME: Arup Bhattacharyya
DOCKET NO.: 1303.023US1

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2970

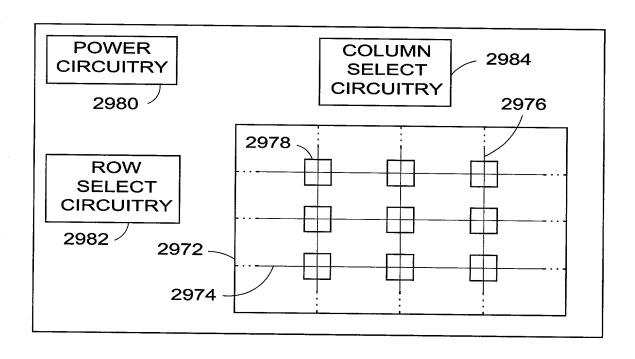


Fig. 29